HOT-MIX ASPHALT - Mix Selection

DISTRICT ONE - HOT-MIX ASPHALT SURFACE TREATMENTS (ENGLISH)

ADT	PAY CODE NO	PAY ITEM DESCRIPTION	UNIT	MIX TYPE	PERCENT AIR VOIDS @ Ndes	Lift Thickness	Unit Weight Lbs/SqYd/in	Notes
		Surface Course						
0 - 10,000	40603335	HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N50	TON	IL 9.5 mm	**4% @ 50 Gyr.**	**1-1/2"**	**112**	1, 5, 8
10,000 - 25,000	40603340	HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N70	TON	IL 9.5 mm	**4% @ 70 Gyr.**	**1-1/2"**	**112**	1, 5
25,000 - 35,000	40603565	POLYMERIZED HOT-MIX ASPHALT SURFACE COURSE, MIX "E", N70	TON	IL 9.5 mm	**4% @ 70 Gyr.**	**1-3/4"**	**112**	1
35,000 - 100,000	X4060004	POLYMERIZED HOT-MIX ASPHALT SURFACE COURSE, **STONE MATRIX ASPHALT**, N80	TON	IL 9.5 mm	**3.5% @ 80 Gyr.**	**1-3/4"**	**112**	1, 5
100,000 +	X4060006	POLYMERIZED HOT-MIX ASPHALT SURFACE COURSE, **STONE MATRIX ASPHALT**, N80	TON	IL 12.5mm	**3.5% @ 80 Gyr.**	**2"**	**112**	1, 11
		Binder Course						
0 - 10,000	40603080	HOT-MIX ASPHALT BINDER COURSE, IL-19.0, N50	TON		**4% @ 50 Gyr.**	**2-1/4" Min.**	**112**	2, 6, 8
10,000 - 25,000	40603085	HOT-MIX ASPHALT BINDER COURSE, IL-19.0, N70	TON		**4% @ 70 Gyr.**	**2-1/4" Min.**	**112**	2, 6
25,000 - 100,000	40603090	HOT-MIX ASPHALT BINDER COURSE, IL-19.0, N90	TON		**4% @ 90 Gyr.**	**2-1/4" Min.**	**112**	2, 12
100,000 +	40603148	POLYMERIZED HOT-MIX ASPHALT BINDER COURSE, **STONE MATRIX ASPHALT**, N80	TON		**3.5% @ 80 Gyr.**	**2"**	**112**	2, 11, 13
		Leveling Binder						
Over 300 Tons								
All	40600827	POLYMERIZED LEVELING BINDER (MACHINE METHOD), IL-4.75, N50	TON		**3.5% @ 50 Gyr.**	**3/4" - 1"**	**110**	3, 7, 9
< 300 Tons								
0 - 10,000	40600625	LEVELING BINDER (MACHINE METHOD), N50	TON	IL 9.5 mm	**4% @ 50 Gyr.**	**3/4" - 2 1/4"**	**112**	3, 8, 9, 10
10,000 +	40600635	LEVELING BINDER (MACHINE METHOD), N70	TON	IL 9.5 mm	**4% @ 70 Gyr.**	**3/4" - 2 1/4"**	**112**	3, 10
0 - 10,000	40600525	LEVELING BINDER (HAND METHOD), N50	TON	IL 9.5 mm	**4% @ 50 Gyr.**	**3/4" - 2 1/4"**	**112**	4, 8, 10
10,000 +	40600535	LEVELING BINDER (HAND METHOD), N70	TON	IL 9.5 mm	**4% @ 70 Gyr.**	**3/4" - 2 1/4"**	**112**	4, 10

Notes:

1. a) Add the following note: "The unit weight used to calculate all Hot-Mix Asphalt Surface Mixtures is 112 Lbs/SqYd/in".
   b) For reconstruction or new construction, use 2" Surface Course for Full-Depth HMA Pavement - see **Example Cross Section** [Full Depth Pvmt Tab]
   c) If minor roadway resurfacing (Typ. < 250 Tons) use the following surface mix:

40603340	HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N70	TON	IL 9.5 mm	**4% @ 70 Gyr.**

   d) If resurfacing of a Bridge is part of a larger roadway resurfacing use the same mixture as the roadway.
   or If there is only Bridge resurfacing with no roadway resurfacing (< 250 Tons) use w/ "Waterproofing Membrane System" & the following surface mix:
   or If there are only Bridge Repairs with minor roadway resurfacing (< 250 Tons) use the following surface mix:

40603340	HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N70	TON	IL 9.5 mm	**4% @ 70 Gyr.**

2. Used instead of Leveling Binder when the total resurfacing thickness is greater than or equal to 3-3/4" (w/ Mix "D") or 4" (w/ Mix "E") or 3" (w/ SMA Mix)

3. Refer to one of these cases: a) If overlaying bare concrete pavement and using Mix "D" then Leveling Binder thickness will be 3/4" thick
   b) If overlaying bare concrete pavement and using Mix "E" then Leveling Binder thickness will be 1" thick
   c) If overlaying HMA pavement and using Mix "D" or "E" then Leveling Binder thickness will be 3/4" thick

4. Used in small areas that may not be reached with a Paving Machine

5. Use "Mix E, N70" if a Skid Proofing Project, large volume of trucks like a weigh station or at a High Stress Intersection (BDE Manual Chapter 54-1.05(a); Design Lane [54-2.01(c)(2), Fig. 54-2.B] MU Truck >200)

6. Use "Polymerized Binder, IL-19, N 90" if a Skid Proofing Project, large volume of trucks like a weigh station or at a High Stress Intersection (BDE Manual Chapter 54-1.05(a); Design Lane [54-2.01(c)(2), Fig. 54-2.B] MU Truck >200)

7. Do **NOT** use Pay Item for "Strip Reflective Crack Control".

8. **Local Agency** may use surface and binder N30 L (Low ESAL) for ADT<700 and 10% trucks or less (4% Air Voids @ 30 Gyr.)

9. Designer Options:
   A. For high ADT use Mixture IL-4.75.
   B. For intersection use Mixture IL-4.75.
   C. For superelevation correction use Leveling Binder.
   D. **Local Agency** may use either Leveling Binder or the IL-4.75 Mixture on Non-State routes
   E. Do NOT use 4.75 mm Mix on any temporary roads or pavements
   F. For correction to cross-slope, use either Leveling Binder or Binder Course mix

10. Use with Pay Item for "Strip Reflective Crack Control".

11. Use **SMA** on expressways in conjunction with a required Material Transfer Device (MTD) or on arterials as requested by Bureau of Materials

12. If Total binder depth is equal to 2 1/4" then use "POLYMERIZED HMA BINDER COURSE, IL-19.0, N90; 4% @ 90 Gyr."
    If Total binder depth is greater than 2 1/4" then use "POLYMERIZED HMA BINDER COURSE, IL-19.0, N90; 4% @ 90 Gyr." for only the top Binder lift thickness and use regular "HMA BINDER COURSE, IL-19.0, N90; 4% @ 90Gyr" for the remaining thickness

13. If Total binder depth is greater than 2" then use "POLYMERIZED BINDER COURSE, SMA, N80; 3.5% @ 80 Gyr." for only the top Binder lift thickness and use regular "HMA BINDER COURSE, IL-19.0, N90; 4% @ 90Gyr" for the remaining thickness

HOT-MIX ASPHALT - Mix Selection

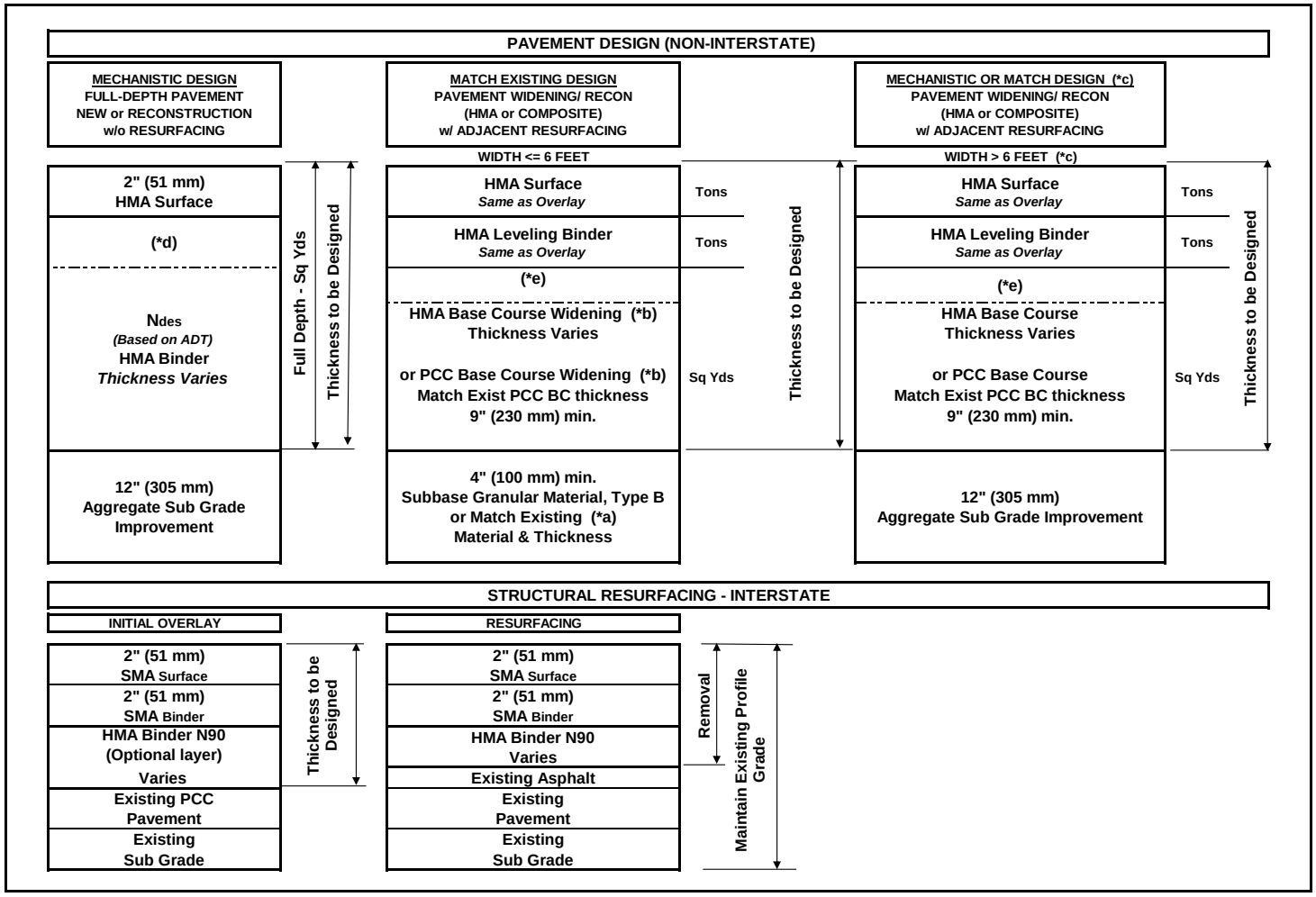
DISTRICT ONE - HOT-MIX ASPHALT SPECIALTY TREATMENTS (ENGLISH)

OPERATIONS	LOCATION	PAY CODE NO	PAY ITEM DESCRIPTION	UNIT	PERCENT AIR VOIDS @ Ndes	Lift Thickness	MIX TYPE	QMP DESIGNATION[6]	Notes
PATCHING	ALL	4420_ _ _ _	CLASS D PATCHES, Of TYPE and THICKNESS specified	SQ YD	**4% @ 70 Gyr.**	**2-1/4" Min.**	CLASS D PATCH (HMA BINDER IL-19 mm)	QC/QA	
	ALL	40601005	HOT-MIX ASPHALT REPLACEMENT OVER PATCHES	TON	**4% @ 70 Gyr.**	**2-1/4" Min.**	HMA REPLACEMENT OVER PATCHES (HMA BINDER IL-19 mm)	QC/QA	
SHOULDER RESURFACING	NON-INTERSTATE		BINDER - SAME AS OVERLAY	TON	**BINDER PROPERTIES - SAME AS OVERLAY**		**BINDER MIX TYPE - SAME AS OVERLAY**	QC/QA or QCP	
			SURFACE - SAME AS OVERLAY	TON	**SURFACE PROPERTIES - SAME AS OVERLAY**		**SURFACE MIX TYPE - SAME AS OVERLAY**	QC/QA or QCP	5
	INTERSTATE	40603085	HOT-MIX ASPHALT BINDER COURSE, IL-19.0, N70	TON	**4% @ 70 Gyr.**	**2-1/4" Min.**	HMA BINDER COURSE, IL 19.0, N70	QC/QA or QCP	
		40603340	HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N70	TON	**4% @ 70 Gyr.**	**1-1/2"**	HMA SURFACE COURSE, MIX "D", N70 (IL 9.5 mm)	QC/QA or QCP	
SHOULDER RECON	NON-INTERSTATE	48203 _ _ _	HOT-MIX ASPHALT SHOULDER, and specify THICKNESS	SQ YD	**4% @ 50 Gyr.**	**2-1/4" Min.**	HMA SHOULDER (HMA BINDER IL-19 mm)	QC/QA or QCP	
			SURFACE - SAME AS OVERLAY	TON	**SURFACE PROPERTIES - SAME AS OVERLAY**		SURFACE MIX TYPE - SAME AS OVERLAY	QC/QA or QCP	5
	INTERSTATE	48203 _ _ _	HOT-MIX ASPHALT SHOULDER, and specify THICKNESS	SQ YD	**4% @ 70 Gyr.**	**2-1/4" Min.**	HMA SHOULDER (HMA BINDER IL-19 mm)	QC/QA or QCP	
			SURFACE - SAME AS OVERLAY	TON	**SURFACE PROPERTIES - SAME AS OVERLAY**		SURFACE MIX TYPE - SAME AS OVERLAY	QC/QA or QCP	
DRIVEWAY	P.E. & C.E.	35501_ _ _	HOT-MIX ASPHALT BASE COURSE, and specify THICKNESS	SQ YD	**4% @ 50 Gyr.**	**2-1/4" Min.**	HMA BASE COURSE (HMA BINDER IL-19 mm)	QC/QA or QCP	
		40603335	HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N50	TON	**4% @ 50 Gyr.**	**2"**	HMA SURFACE COURSE, MIX "D", N50 (IL 9.5 mm)	Same as overlay	
BASE CSE & BASE CSE WIDENING	ALL	35501_ _ _	HOT-MIX ASPHALT BASE COURSE, and specify THICKNESS	SQ YD	**4% @ XX Gyr.**	**2-1/4" Min.**	HMA BASE COURSE (HMA BINDER IL-19 mm)	QC/QA or QCP	3, 4
		35600_ _ _	HOT-MIX ASPHALT BASE COURSE WIDENING, and specify THICKNESS	SQ YD	**4% @ XX Gyr.**	**2-1/4" Min.**	HMA BASE COURSE WIDENING (HMA BINDER IL-19 mm)	QC/QA or QCP	3, 4
FULL DEPTH PAVEMENT	ALL	4070_ _ _ _	HOT-MIX ASPHALT PAVEMENT (FULL-DEPTH), and specify THICKNESS	SQ YD	**4% @ XX Gyr.**	**2-1/4" Min.**	HMA BINDER COURSE (BASED ON ADT)	QC/QA, QCP, or PFP	2
						2"	HMA SURFACE COURSE, (BASED ON ADT)	QC/QA, QCP, or PFP	
TEMPORARY ROAD	ALL	Z0062456	TEMPORARY PAVEMENT (Thickness shown on Plans)	SQ YD	**4% @ 70 Gyr.**	**2-1/4" Min.**	TEMP PAVEMENT (HMA BINDER IL-19 mm)	QC/QA or QCP	1
					4% @ 70 Gyr	**2"**	HMA SURFACE COURSE, MIX "D", N70 (IL 9.5 mm)	QC/QA or QCP	1
MEDIAN SURFACE/ BIKEWAY	MEDIAN SURFACE/ BIKEWAY	40603335	HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N50	TON	**4% @ 50 Gyr.**	**2" Min.**	HMA SURFACE COURSE, MIX "D", N50 (IL 9.5 mm)	QC/QA or QCP	
STABILIZED SUBBASE	AS SPECIFIED	31200_ _ _	STABILIZED SUB-BASE-HOT-MIX ASPHALT & specify THICKNESS	SQ YD	**3% @ 50 Gyr.**	**4"**	STABILIZED SUBBASE (HMA BINDER IL-19 mm)	QC/QA or QCP	

Notes:

1. HMA temporary pavement usually consists of two items: an HMA binder course; typically 8"-10" and an HMA surface course; typically 2" (required when in place for more than one construction season).
   When PC Temp Pavement is used as an option, the following note shall appear on the plans adjacent to the HMA Mix Table: "PC concrete temporary pavement shall consist of Class PV Concrete meeting the requirements of Art. 1020 of the Standard Specifications, PCC pavement XX" thick. Temporary PCC pavement does not require dowel bars."
   All temporary pavement shall be provided over an improved subgrade; typically 4" Subbase Granular Material, Type B or 12" Aggregate Subgrade Improvement as directed by the District Geotechnical Engineer.
   For quantity estimation purposes, excavation quantities should be estimated assuming the thicker design if both design options are shown in the plans.
   Consult with the Bureau of Materials for QMP designations for extended use Temporary Pavement.
2. If using an N90 Binder mix, then use "POLYMERIZED HMA BINDER COURSE, IL-19.0, N90" for the **TOP** 2 1/4" lift.
3. If using an N90 Binder mix, then use "HMA Binder Course, IL-19.0, N90"
4. The Number of Gyrations is the same as the Ndesign of the Surface Mixture
5. **For shoulder width <= 6':** Surface same as overlay. **For shoulder width > 6':** HMA Surface Course, Mix "D", N70 or HMA Surface Course, Mix "D", N50 if mainline is also N50.
6. Quality Management Program (QMP) consists of up to 3 designations: Quality Control/Quality Assurance (QC/QA), Quality Control for Performance (QCP), or Pay for Performance (PFP).

HOT-MIX ASPHALT - Mix Selection



All Thicknesses Determined by the Pavement Design Engineer. If reconstruction/widening > 4,750 SqYds also need BDE approval.

(*a) May try to match existing pavement Design; depends on quality of existing material which needs to be verified with Pavement Cores.

(*b) May also use "BASE COURSE WIDENING" which gives contractor option to use PCC or HMA. "PCC Base Course Widening" or "HMA Base Course Widening" is a good option when you have a difficult to compact area for HMA; see Pavement Design Engineer

(*c) Must be able to fit a 6 ft roller and a majority of the area will be compacted by the 6 ft or larger roller. If adding full lane width or wider consider using Mechanistic Design; i.e. 2" Surface Course w/ no leveling binder

(*d) If using an N90 Binder mix, and no IL 4.75 layer, then use "POLYMERIZED HMA BINDER COURSE, IL-19.0, N90" for the **TOP** Binder lift thickness. (New or reconstruction)

(*e) If using an N90 Binder Mix, use (IL-4.75 with HMA BINDER COURSE, IL-19.0, N90) or (POLYMERIZED HMA BINDER COURSE, IL-19.0, N90 for the TOP lift if also used on mainline resurfacing).

See Bureau of Materials regarding mixture questions.

EXAMPLES -- (Mix Tables Required on Plans)

*****INTENDED AS EXAMPLE ONLY - Use actual mixtures needed based on ADT; QMP type will be assigned by the Bureau of Materials*****

SMART or 3P RESURFACING PROJECTS

	HOT-MIX ASPHALT MIXTURE REQUIREMENTS		QUALITY MANAGEMENT PROGRAM (QMP)	
	MIXTURE TYPE	AIR VOIDS @ Ndes		
	HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N70 (IL 9.5 mm)	4% @ 70 Gyr.		
3P Only =>	POLYMERIZED LEVELING BINDER (MACHINE METHOD), IL-4.75, N50	3.5% @ 50 Gyr.		
	CLASS D PATCHES (HMA BINDER IL-19 mm)	4% @ 70 Gyr.		
	HMA REPLACEMENT OVER PATCHES (HMA BINDER IL-19 mm)	4% @ 70 Gyr.		<= *use only if patching first before milling*
	QMP Designations: Quality Control/Quality Assurance (QC/QA); Quality Control for Performance (QCP); Pay for Performance (PFP)			

see 1 **==>** THE UNIT WEIGHT USED TO CALCULATE ALL HMA SURFACE MIXTURE QUANTITIES IS 112 LBS/SQ YD/IN.

see 2 **==>** THE "AC TYPE" FOR POLYMERIZED HMA MIXES SHALL BE "SBS/SBR PG 76 -22" AND FOR NON-POLYMERIZED HMA THE "AC TYPE" SHALL BE "PG 64 -22" UNLESS MODIFIED BY DISTRICT ONE SPECIAL PROVISIONS.
FOR USE OF RECYCLED MATERIALS SEE SPECIAL PROVISIONS.
QUALITY MANAGEMENT PROGRAM (QMP) IDENTIFIES THE PARTICULAR QUALITY CONTROL SPECIFICATION THAT APPLIES TO THE HMA MIXTURE

INTERSECTION RECONSTRUCTION or ROADWAY WIDENING PROJECTS

HOT-MIX ASPHALT MIXTURE REQUIREMENTS		QUALITY MANAGEMENT PROGRAM (QMP)	
MIXTURE TYPE	AIR VOIDS @ Ndes		
PAVEMENT RESURFACING			
HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N50 (IL 9.5 mm)	4% @ 50 Gyr.		
POLYMERIZED LEVELING BINDER (MACHINE METHOD), IL-4.75, N50	3.5% @ 50 Gyr.		
FULL DEPTH PAVEMENT			
POLYMERIZED HOT-MIX ASPHALT SURFACE COURSE, SMA, N80	3.5% @ 80 Gyr.		
POLYMERIZED HMA BINDER COURSE, IL-19.0, N90; TOP 2-1/4"	4% @ 90 Gyr.		
HMA BINDER COURSE, IL-19.0, N90	4% @ 90 Gyr.		
TEMPORARY PAVEMENT			
HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N50 (IL 9.5 mm); 2"	4% @ 50 Gyr.		
HOT-MIX ASPHALT BINDER COURSE, IL-19.0, N50	4% @ 50 Gyr.		
PAVEMENT WIDENING			
HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N50 (IL 9.5 mm)	4% @ 50 Gyr.		
POLYMERIZED LEVELING BINDER (MACHINE METHOD), IL-4.75, N50	3.5% @ 50 Gyr.		
HMA BASE COURSE (HMA BINDER IL-19 mm); 10"	4% @ 50 Gyr.		
DRIVEWAYS			
HMA SURFACE COURSE, MIX D, N 50 (IL 9.5 mm); 2"	4% @ 50 Gyr.		
HMA BASE COURSE (HMA BINDER IL-19 mm); PE -6", CE - 8"	4% @ 50 Gyr.		
PATCHING			
CLASS D PATCHES (HMA BINDER IL-19 mm)	4% @ 70 Gyr.		
HMA REPLACEMENT OVER PATCHES (HMA BINDER IL-19 mm)	4% @ 70 Gyr.		<= *use only if patching first before milling*
QMP Designations: Quality Control/Quality Assurance (QC/QA); Quality Control for Performance (QCP); Pay for Performance (PFP)			

see 1 **==>** THE UNIT WEIGHT USED TO CALCULATE ALL HMA SURFACE MIXTURE QUANTITIES IS 112 LBS/SQ YD/IN.

see 2 **==>** THE "AC TYPE" FOR POLYMERIZED HMA MIXES SHALL BE "SBS/SBR PG 76 -22" AND FOR NON-POLYMERIZED HMA THE "AC TYPE" SHALL BE "PG 64 -22" UNLESS MODIFIED BY DISTRICT ONE SPECIAL PROVISIONS.

see 2 **==>** FOR HMA FULL DEPTH "AC TYPE" SEE SPECIAL PROVISIONS.

see 2 **==>** FOR USE OF RECYCLED MATERIALS SEE SPECIAL PROVISIONS.

see 3 **==>** QUALITY MANAGEMENT PROGRAM (QMP) IDENTIFIES THE PARTICULAR QUALITY CONTROL SPECIFICATION THAT APPLIES TO THE HMA MIXTURE

1. This NOTE must always be present under the Mixture Table when including a pay item for Surface Course measured in Tons.

2. This NOTE Refers to the following District One Special Provisions:
"Reclaimed Asphalt Pavement and Shingles (D-1)" - RAP-RAS(D1).doc
"HMA Mixture Design Requirements (D-1)" - HMA Mix Des Reqmts(D-1).doc

3. Refers to the following specifications: HMA-Quality Control for Performance-Jobsite Sampling (BMPR)
HMA-Pay for Performance using Percent within Limits-Jobsite Sampling (BDE)

4. The Number of Gyrations must match the Ndes used for all mixtures